

Office Action Summary

Application No.

10/608,606

Applicant(s)

LEE ET AL.

Examiner

Shouxiang Hu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Election/Restrictions***

Applicant's election with traverse of claims 1-8, 12 and 19 in Paper No. 20040924 is acknowledged. The traversal is on the ground(s) that the restriction requirement does not specify the distinctiveness between the elected species and the alleged other species. This is not found fully persuasive because at least Figs. 4A-4E and Figs. 5A-5D clearly show two distinctively different device packaging/mounting structures, corresponding to of the species identified in the previous Office action. Beside, as stated in the previous Office action, claim 1 is identified as generic to all of the other pending claims. And, it is reassured that, upon the allowance of a generic claim like claim 1, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

The requirement is still deemed proper.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 12 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi (US 2003/0040138).

Kobayashi discloses a method for fabricating a semiconductor device (Figs. 15-16; also see Paragraphs 0016 and 0019), comprising: providing a substantially planar substrate (5) comprising a through-hole formed through drilling and extending between the major surfaces; filling the through-hole with a conductive interconnecting element (TH, through plating); and forming a conductive mounting pad and a conductive connecting pad (7 and 10 in Fig. 15C; after plating) on different ones of the major surfaces in electrical contact with the conductive interconnecting element (TH). And, it is noted that the pad 7 therein can be naturally regarded as a mounting pad since at least one terminal of the wire 12 therein is mounted on the pad 7 (see Fig. 15D).

Regarding claims 5-7, the layers 20 and 21 in Kobayashi are each readable as a seed layer as the plated portion in the final pads 7 and 10 are respectively plated thereon. And, the method of Kobayashi further comprises: forming the seed layer (20 and/or 21) on the substrate of an unfired ceramic; firing (i.e., sintering) the ceramic after drilling the hole(s) therein; and forming additional layers (the plated portion, see Paragraph 0016) on the seed layers after the firing.

Regarding claim 12, the substrate in Kobayashi additionally comprises an additional filled through hole connected to additional conductive bonding pad and conductive connecting pad (8 and 11).

Regarding claim 19, the method of Kobayashi naturally further comprises providing a wafer of which the substrate constitutes part; and, after the filling and the forming, singulating the wafer into individual devices (see the step of DICING in Fig. 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Rapoport (US 5,298,687).

The disclosure of Kobayashi is discussed as applied to claims 1-7, 12 and 19 above.

Although Kobayashi does not expressly disclose that the seed layer can be formed by screen printing, it is noted that screening printing is one of the art known common methods for forming a seed layer for achieving good plating quality with low cost, as evidenced in Rapoport (see the seed layer 2 in Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the seed-layer screen-printing step of Rapoport into the method of Kobayashi, so that a method for making a semiconductor device having high quality plated pads therein with low cost would be obtained.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C-G are cited as being related to a method of packaging with through-holes in the substrate.

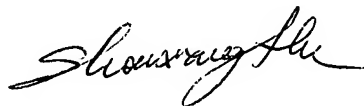
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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December 10, 2004



SHOUXIANG HU
PRIMARY EXAMINER